FIG. 1A

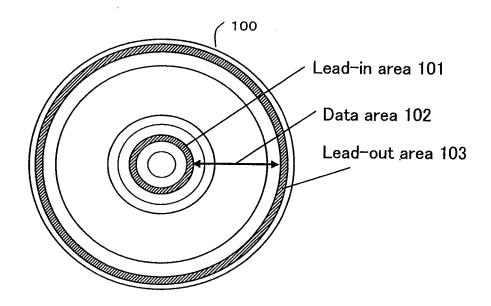


FIG. 1B

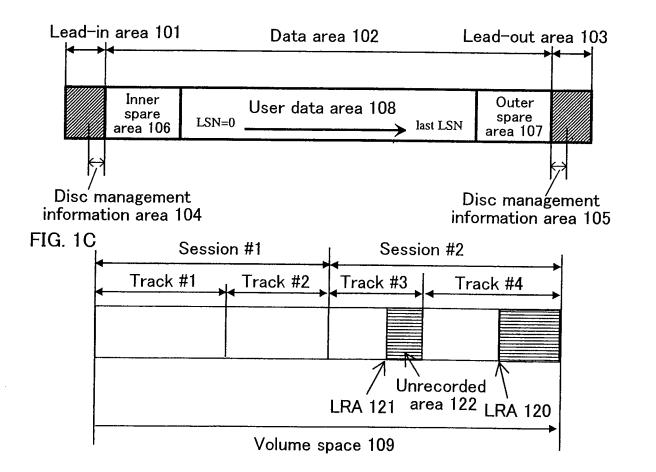


FIG. 2A
Session management information 200

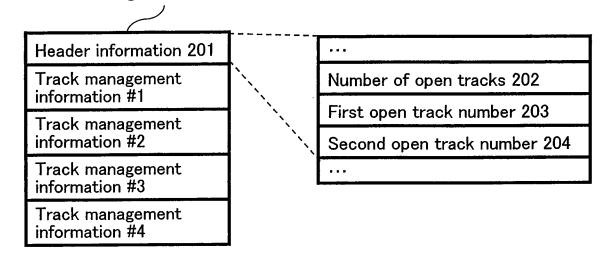


FIG. 2B

Track management information 210

| locat | start on Last recorded address information within track (LRA) 213 |
|-------|---|
|-------|---|

FIG. 2C
Space bitmap management information 220

Header information 221

Managed area information 222

Space bitmap information 223

FIG.3

Disc structure information 1100

| General information 1101 |
|---|
| Replacement management information list location information 1102 |
| User area start location information 1103 |
| User area end location information 1104 |
| Spare area information 1105 |
| Recording mode information 1106 |
| Last recorded address information 1107 |
| Disc management information area information 1107b |
| Spare area management information 1108 |
| Session management information location information 1109 |
| Space bitmap management information location information 1110 |

FIG.4

100b

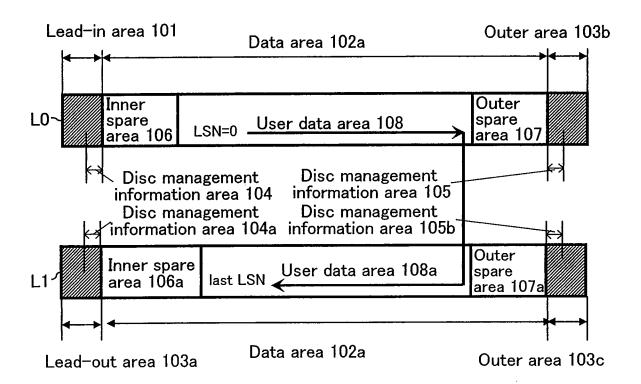


FIG.5A

Replacement management information list 1000

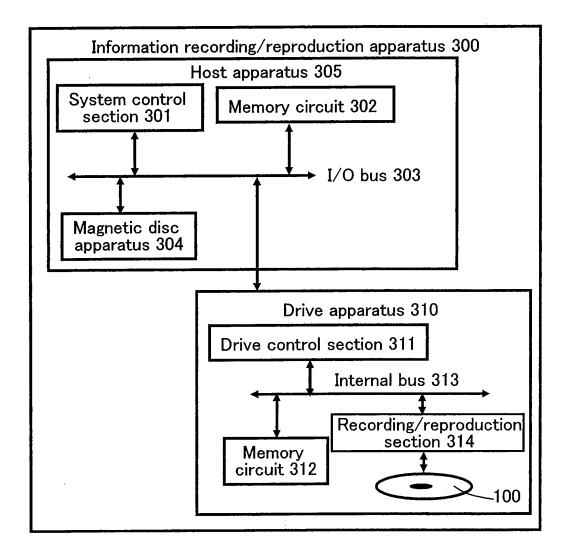
Header information 1001
Replacement management information #1
Replacement management information #2
Replacement management information #3
...
Terminator information
00h

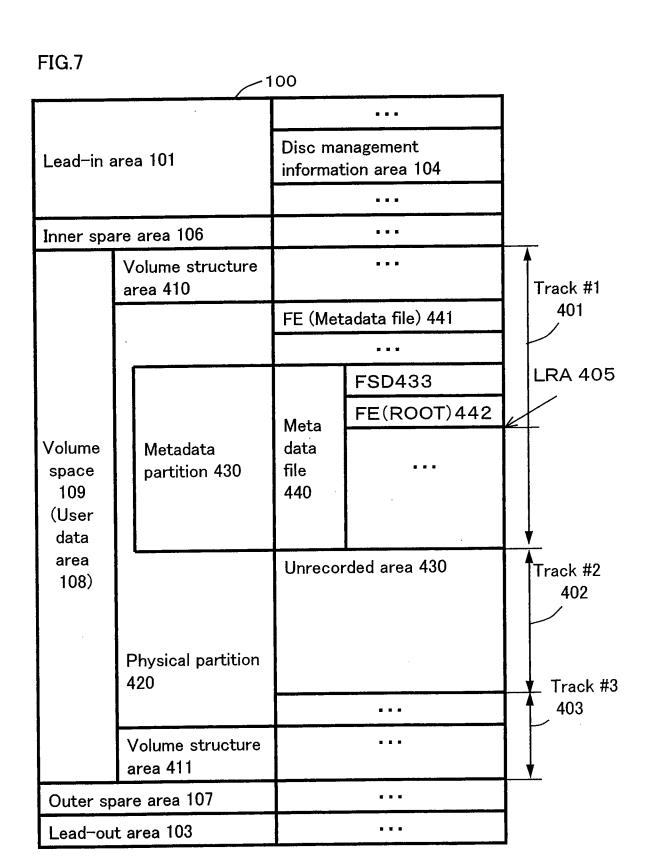
FIG.5B

Replacement management information 1010

| Status information 1011 | Original location information 1012 | Replacement location information 1013 |
|-------------------------------|------------------------------------|---|

FIG.6





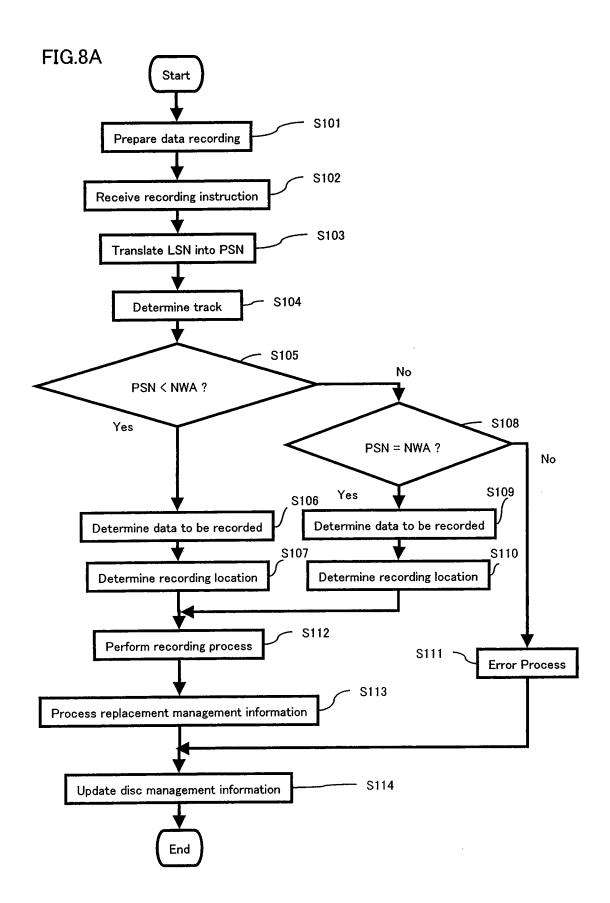
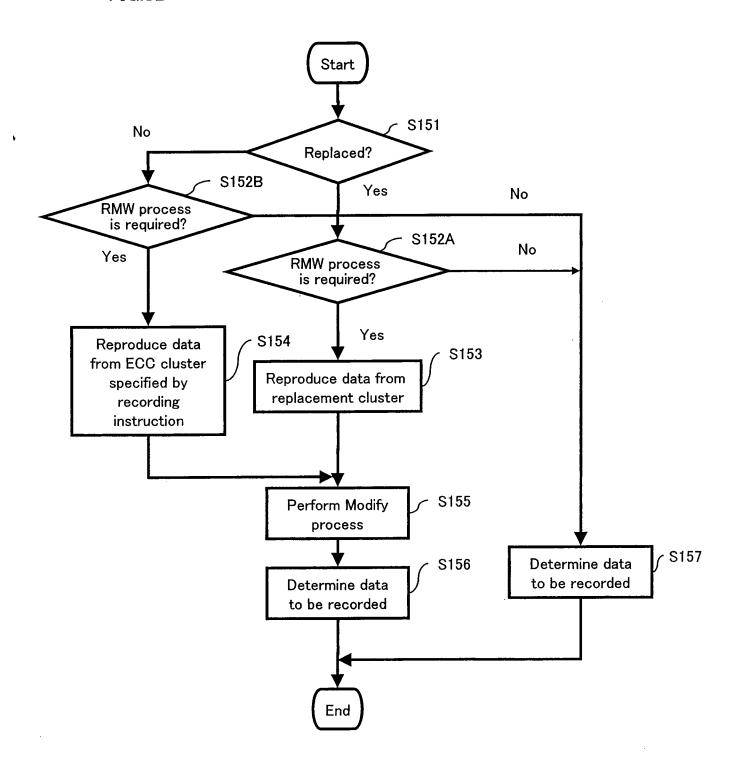
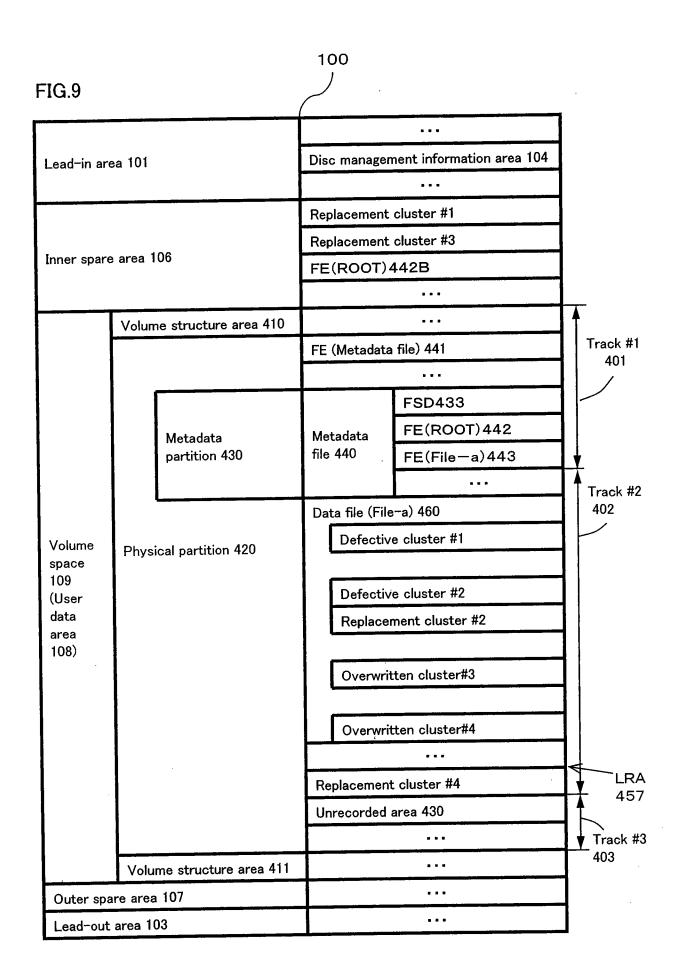


FIG.8B





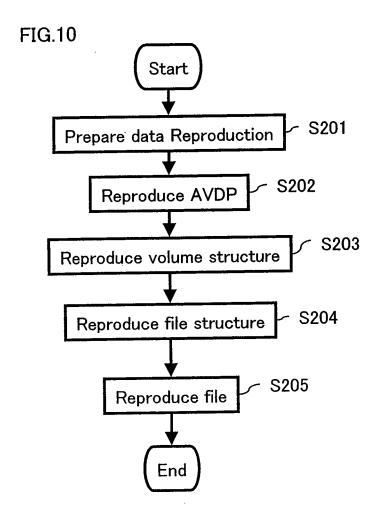


FIG.11 Replacement management information 1010B

| Statu | Status information 1011 | | Original location information 1012 | Replacement location | Туре |
|-------|----------------------------|-------|---|--|------|
| Flag1 | Flag2 | Flag3 | information 1013 | | |
| 0 | 0 | 00 | Defective cluster or Overwritten cluster cluster location information (in Spare area | | (1) |
| 0 | 0 | 01 | Defective clusters or Overwritten clusters start location information | Replacement cluster start location information (in Spare area) | (2) |
| 0 | 0 | 10 | Defective clusters or Overwritten clusters end location information | Replacement cluster end location information (in Spare area) | (3) |
| 0 | 1 | 00 | Defective cluster or Overwritten cluster location information | Replacement cluster location information (in User data area) | (4) |
| 0 | 1 | 01 | Defective clusters or Overwritten clusters start location information | Replacement cluster start location information (in User data area) | (5) |
| 0 | 1 | 10 | Defective clusters or Overwritten clusters end location information information (in User data area) | | (6) |
| 1 | 0 | 00 | Defective cluster location information | | (7) |

Flag1

For replacement: 0

For defect: 1

Flag2

Replace in Spare area or no replacement cluster: 0 Replace in User data area: 1

Flag3
Single cluster: 00
Contiguous clusters (start location): 01
Contiguous clusters (end location): 10

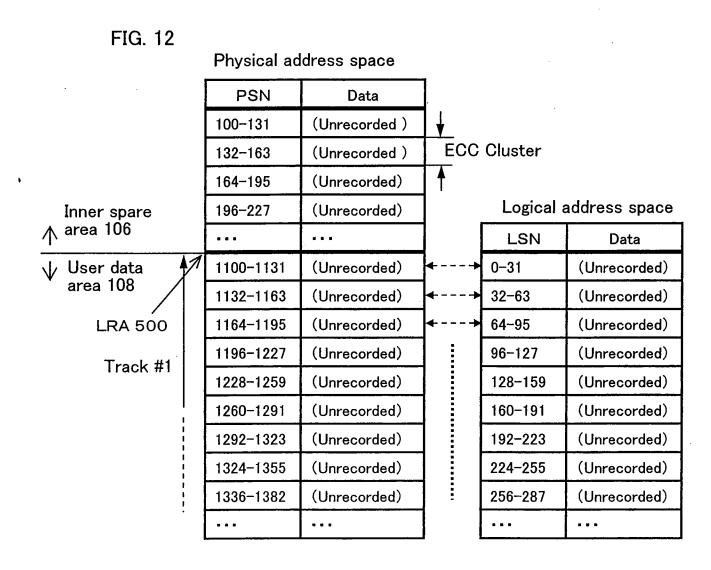
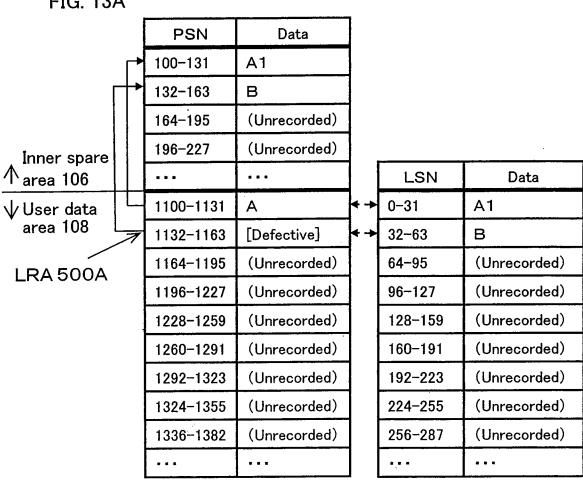
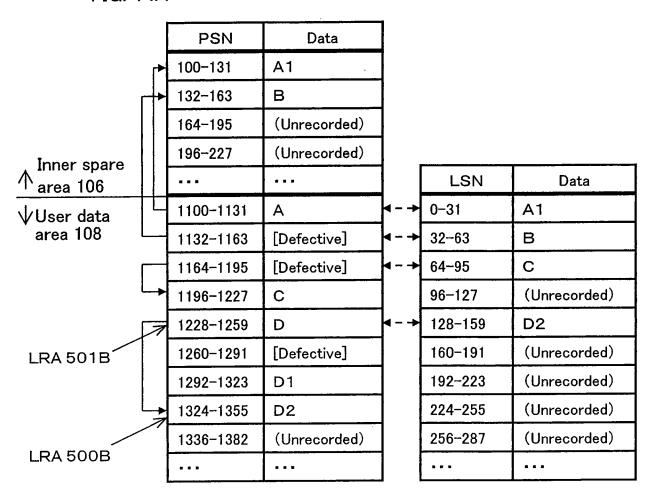


FIG. 13A



| FIG. 13B | | | | 1000A ر | | _ |
|----------|---|---------------|-----|----------------------|----------------------|------------|
| | | itus ormat | ion | Original location | Replacement location | |
| | 0 | 0 | 00 | 1100 | 100 | 511 |
| | 0 | 0 | 00 | 1132 | 132 | 512 |

FIG. 14A



| FIG. 14B | | | | 1000B | | _ |
|----------|-----------------|---|----|----------------------|----------------------|------------|
| , | Stati infori | | n | Original location | Replacement location | |
| | 0 | 0 | 00 | 1100 | 100 | 511 |
| | 0 | 0 | 00 | 1132 | 132 | 512 |
| | 0 | 1 | 00 | 1164 | 1196 | 513 514 |
| | 0 | 1 | 00 | 1228 | 1292 | 514A |
| | 0 | 1 | 00 | 1228 | 1324 | 515 |
| | 1 | 0 | 00 | 1260 | 0 | 7 |

FIG. 15A

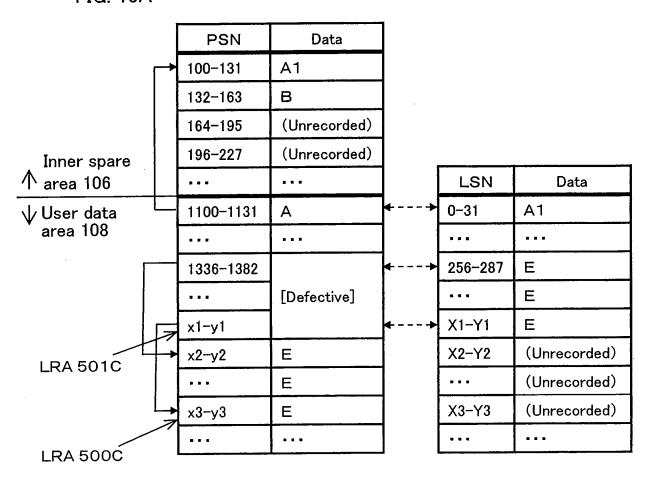
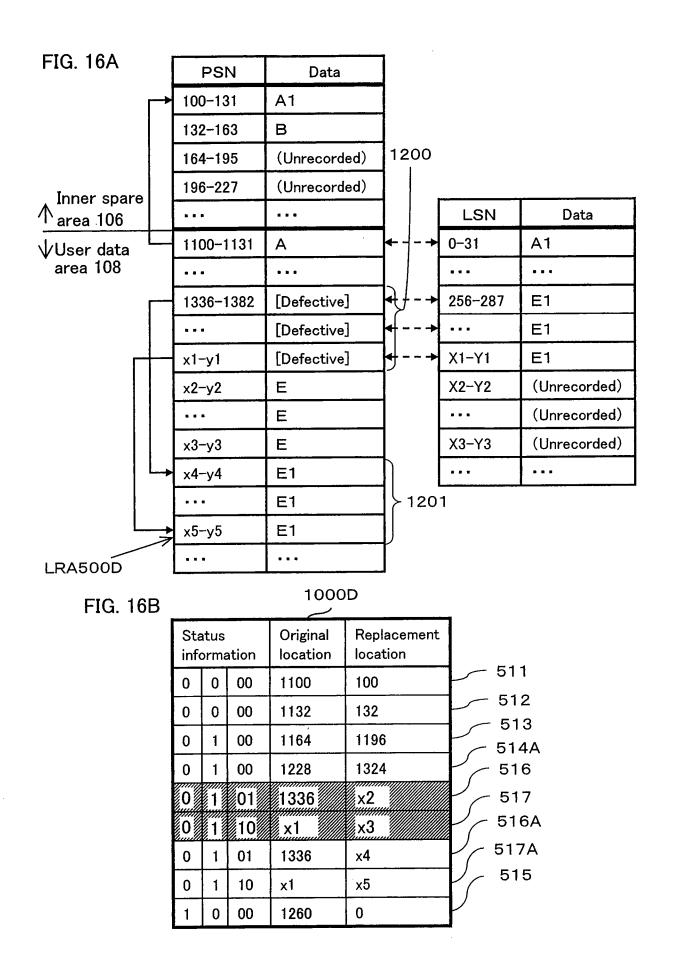
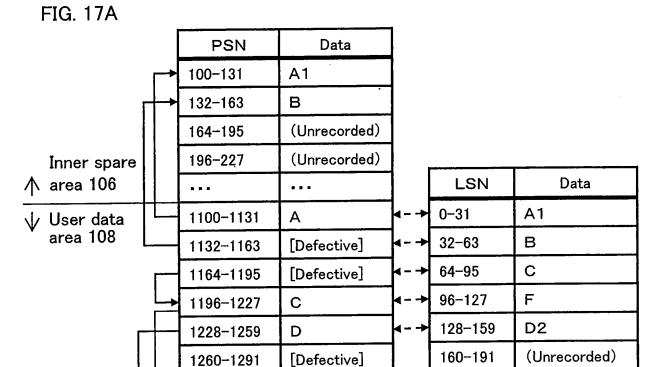


FIG. 15B 1000C Original Replacement Status location information location 一 514A x2 x1 x3





D1

D2

F

G

. . .

(Unrecorded)

(Unrecorded)

(Unrecorded)

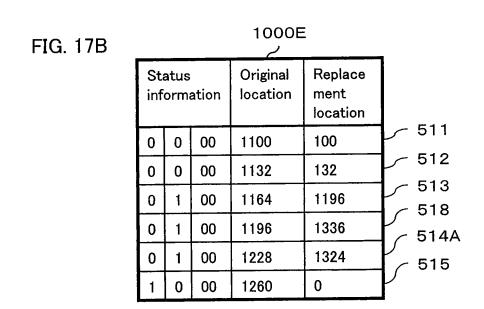
G

192-223

224-255

256-287

288-319



1292-1323

1324-1355

1336-1382

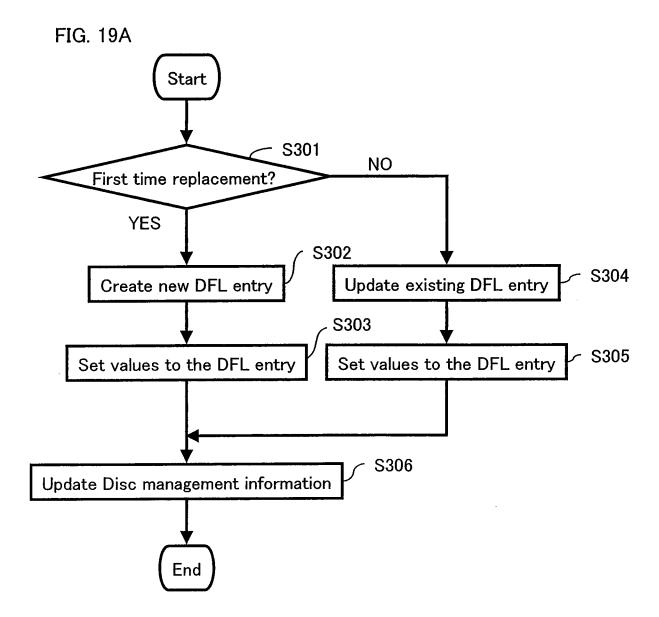
1383-1414

LRA 500E

FIG. 18

DFL entry 2010

| Status 1 | Defective cluster | Status 2 | Replacement cluster |
|----------|-------------------|----------|---------------------|
| 2011A | first PSN 2012 | 2011B | first PSN 2013 |



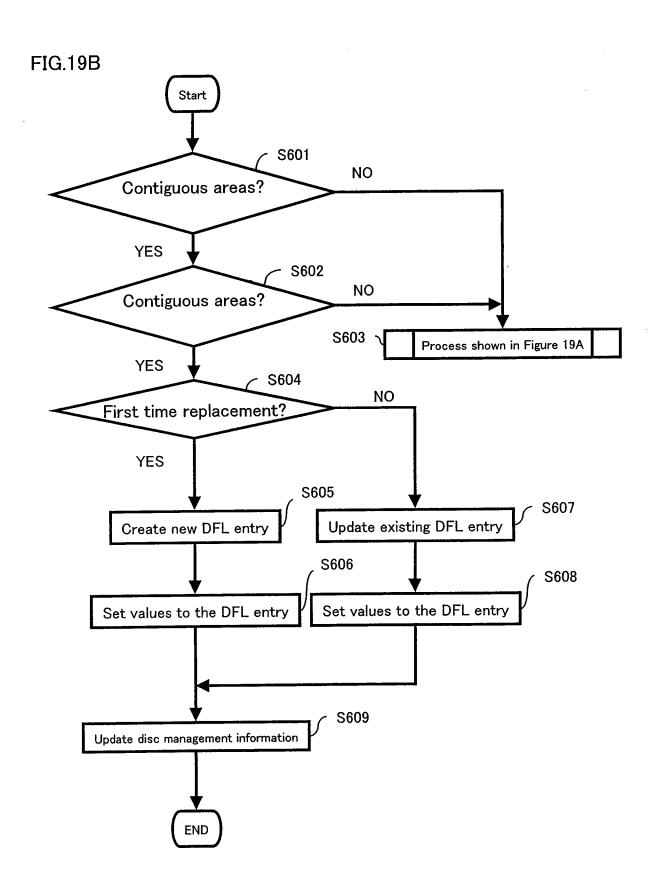


FIG. 20A

| | PSN | Data |] | | |
|---------------------------|-----------|--------------|----|---------|--------------|
| LRA | | | | LSN | Data |
| | 1000-1131 | A0 | ++ | 0-31 | AO |
| | 1132-1163 | (Unrecorded) | | 32-63 | (Unrecorded) |
| | 1164-1195 | (Unrecorded) |] | 64-95 | (Unrecorded) |
| | 1196-1227 | (Unrecorded) |] | 96-127 | (Unrecorded) |
| | 1228-1259 | (Unrecorded) | | 128-159 | (Unrecorded) |
| | 1260-1291 | (Unrecorded) | | 160-191 | (Unrecorded) |
| | 1292-1323 | (Unrecorded) | | 192-223 | (Unrecorded) |
| User data | 1324-1355 | (Unrecorded) | | 224-255 | (Unrecorded) |
| ↑ area 108 | ••• | | | • • • | ••• |
| √ Outer spare area 107 | x10-y10 | ••• |] | | |
| | | | | | |

FIG. 20B

Header information 1001

FIG. 21A

| LRA User data | PSN | Data | | | |
|----------------------|-----------|--------------|------------|---------|--------------|
| | | | ∢ ▶ | LSN | Data |
| | 1000-1131 | AO | | 0-31 | A1 |
| | 1132-1163 | A1 | | 32-63 | (Unrecorded) |
| | 1164-1195 | (Unrecorded) | | 64-95 | (Unrecorded) |
| | 1196-1227 | (Unrecorded) | | 96-127 | (Unrecorded) |
| | 1228-1259 | (Unrecorded) | | 128-159 | (Unrecorded) |
| | 1260-1291 | (Unrecorded) | | 160-191 | (Unrecorded) |
| | 1292-1323 | (Unrecorded) | | 192-223 | (Unrecorded) |
| | 1324-1355 | (Unrecorded) | | 224-255 | (Unrecorded) |
| ↑ area 108 | | |] | | ••• |
| V Outer spare | x10-y10 | | | | |
| area 107 | • • • | | | | |

FIG. 21B

| Header | informatio | n 1001 | | . 01004 |
|--------|------------|--------|------|---------|
| 0000 | 1000 | 0000 | 1132 | 2100A |

FIG. 22A

| | PSN | Data | | | |
|---------------|-----------|--------------|------------------|---------|--------------|
| | | | 4 - + | LSN | Data |
| | 1000-1131 | A0 | | 0-31 | A2 |
| | 1132-1163 | A1 | | 32-63 | (Unrecorded) |
| | 1164-1195 | A2 | | 64-95 | (Unrecorded) |
| | 1196-1227 | (Unrecorded) | | 96-127 | (Unrecorded) |
| LRA | 1228-1259 | (Unrecorded) | | 128-159 | (Unrecorded) |
| | 1260-1291 | (Unrecorded) | | 160-191 | (Unrecorded) |
| | 1292-1323 | (Unrecorded) | | 192-223 | (Unrecorded) |
| User data | 1324-1355 | (Unrecorded) | | 224-255 | (Unrecorded) |
| ↑ area 108 | ••• | ••• | | | |
| V Outer spare | x10-y10 | | | | |
| area 107 | | | | | |

FIG. 22B

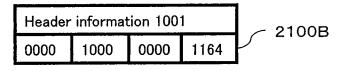


FIG. 23A

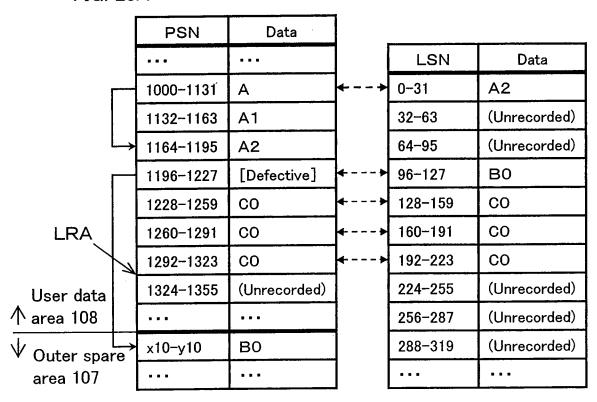


FIG. 23B

| Heade | | | | |
|-------|------|------|------|-------|
| 0000 | 1000 | 0000 | 1164 | 2100B |
| 0000 | 1196 | 0000 | x10 | 2101A |

FIG. 24A

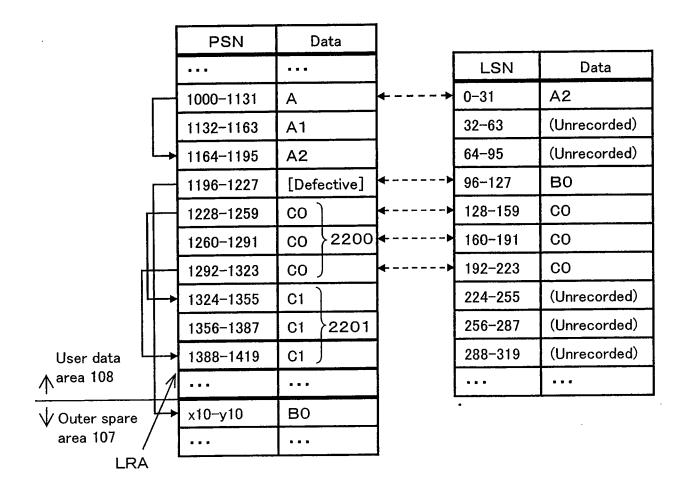


FIG. 24B

| | | | | 4 |
|--------|------|------|------|----------|
| Header | | | | |
| 0000 | 1000 | 0000 | 1164 | 2100B |
| 0000 | 1196 | 0000 | x10 | ~ 2101A |
| 0000 | 1228 | 0001 | 1324 | 2102A حر |
| 0000 | 1292 | 0010 | 1388 | 2103A |

FIG. 25

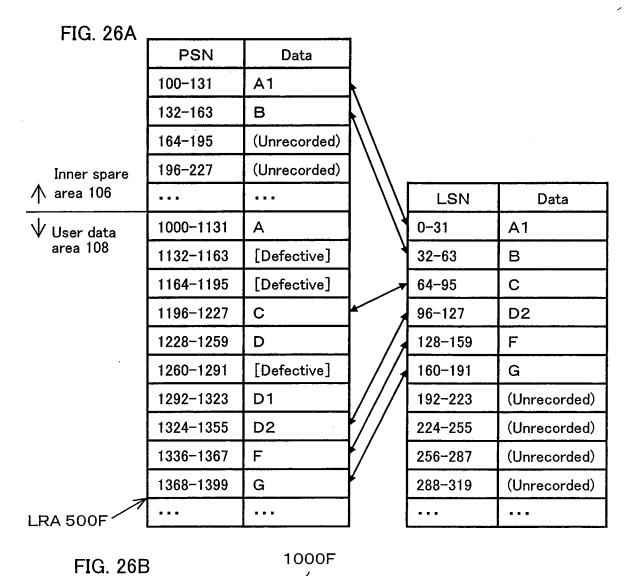
3210

Session start information 211

Track start location information 212

Last recorded address information within track (LRA) 213

Last recorded logical address information within track 3214



| 3E | 3 | | | 1000 | /I | _ |
|-----|--------------------|--|-------------------------------|------|------|------------|
| | Status information | | Original Replacement location | | | |
| | 0 | 0 | 00 | 1000 | 100 | 521 522 |
| į | 0 | 0 | 00 | 1132 | 132 | 523 |
| | 0 | 1 | 00 | 1164 | 1196 | 524 |
| | 0 | 1 | 00 | 1196 | 1324 | 525 |
| | 0 | 1 | 00 | 1228 | 1336 | 526 |
| | 0 | 1 | 00 | 1260 | 1368 | 530 |
| | 1 | 0 | 00 | 1132 | 0 | 531 |
| | 1 | 0 | 00 | 1164 | 0 | 532 |
| | 1 | 0 | 00 | 1260 | 0 | Y |
| - 1 | THE PARTY OF | THE PARTY OF THE P | | | | l |

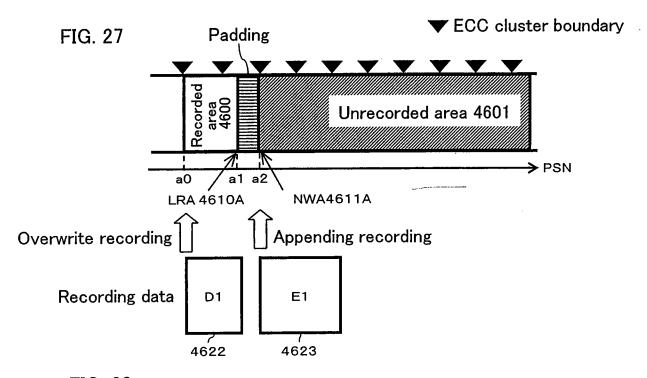
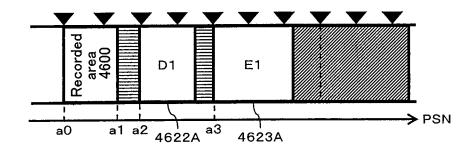
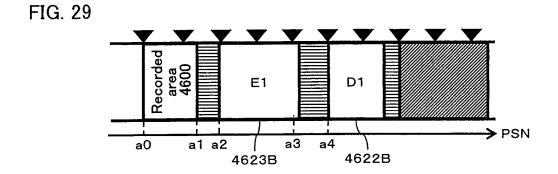


FIG. 28





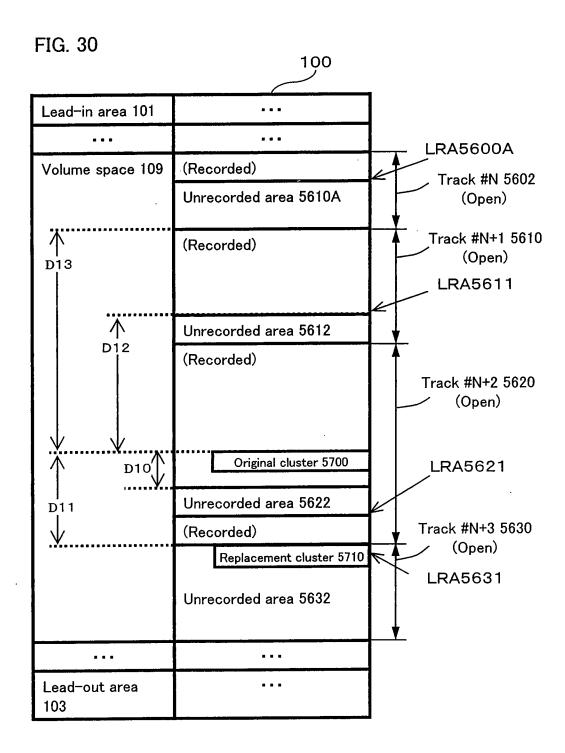


FIG. 31

| 110.01 | | | <u></u> | | | |
|-------------------|----------------------------|--------------------------|-------------------------------|---------------------------------------|--|--|
| Lead−in area | | | ••• | | | |
| | | | Disc management structure 2 | | | |
| | | | ••• | | | |
| Spare are | Spare area | | 1 | | | |
| | Volume structure area 3 | | | | | |
| | | | FE (Metada | FE (Metadata file) 7a | | |
| | | | | FSD12 | | |
| | | Metadata partition 5a | | FE(ROOT)13 | | |
| | | | | FE(Dir-A) | | |
| | | | Metadata file 6a | FE(Dir-B) | | |
| | | | | FE(File-a) | | |
| Volume | | | | FE(File-b) | | |
| space 2 | | | | Unrecorded area 11a | | |
| | | | FE (Metadata mirror file) 7b | | | |
| | | Metadata partition 5b | Metadata mirror file 6b | (Duplication of Metadata file 440) | | |
| | | | | Unrecorded area 11b | | |
| | Physical partition 4 | | Data file (File-a) 8 | | | |
| | | | Data file (File-b) 9 | | | |
| | | | Unrecorded area 11c | | | |
| Volume area 3b | | olume structure ea 3b | ••• | | | |

FIG. 32

| 110. 32 | | | | | |
|---------------|-----------------------------|-----------------------------|-------------------------------|------------------------------------|--|
| Lead−in area | | ••• | | | |
| | | Disc management structure 2 | | | |
| | | | | | |
| | | | | | |
| Spare area 17 | | FE(ROOT)16 | | | |
| | | | | | |
| | Volume structure area 3 | | ••• | | |
| | | | FE (Metadata file) 7a | | |
| | | | Metadata file 6a | FSD12 | |
| | | Metadata partition 5a | | FE(ROOT)13 | |
| | | | | FE(Dir-A) | |
| | | | | FE(Dir-B) | |
| | | | | FE(File-a) | |
| | | | | FE(File-b) | |
| Volume | | | | FE(File-c)14 | |
| space 2 | | | | Unrecorded area 11a | |
| | | | FE (Metadata | a mirror file) 7b | |
| ĺ | | Metadata | Metadata mirror file 6b | (Duplication of Metadata file 440) | |
| | | partition 5b | | Unrecorded area 11b | |
| | | | Data file (File-a) 8 | | |
| | PI | nysical partition | Data file (File-b) 9 | | |
| | 420 | | Data file (File-c) 15 | | |
| | | | Unrecorded area 11c | | |
| | Volume structure area 3b | | ••• | | |

FIG. 33A

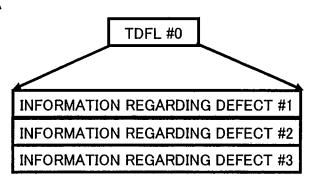
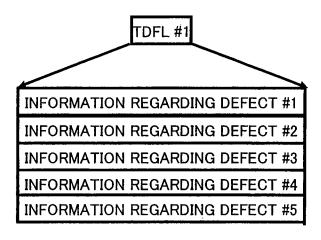


FIG. 33B



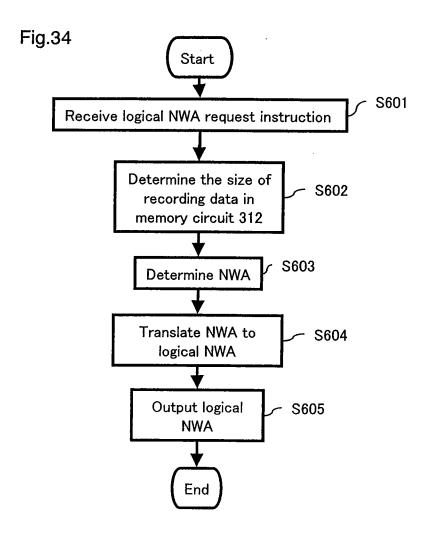
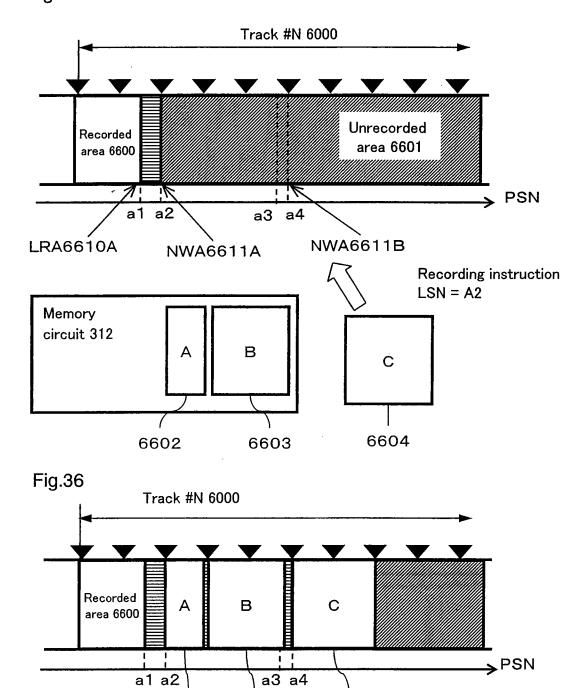


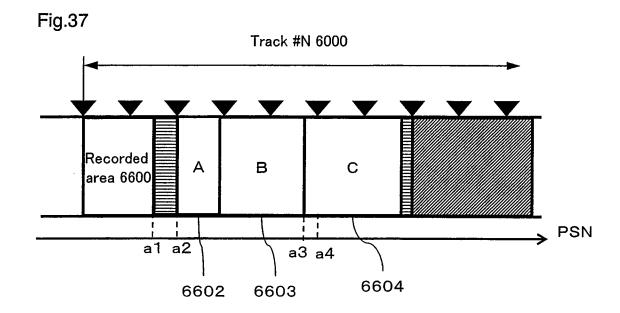
Fig.35

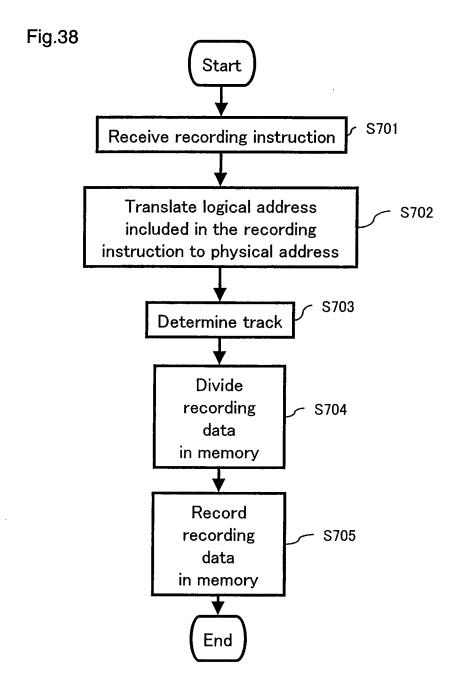


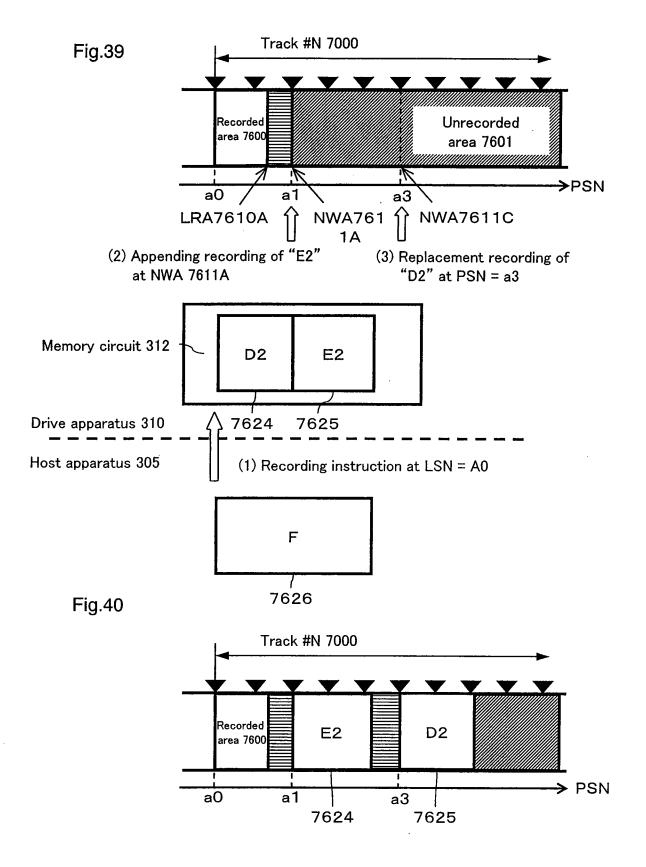
6604

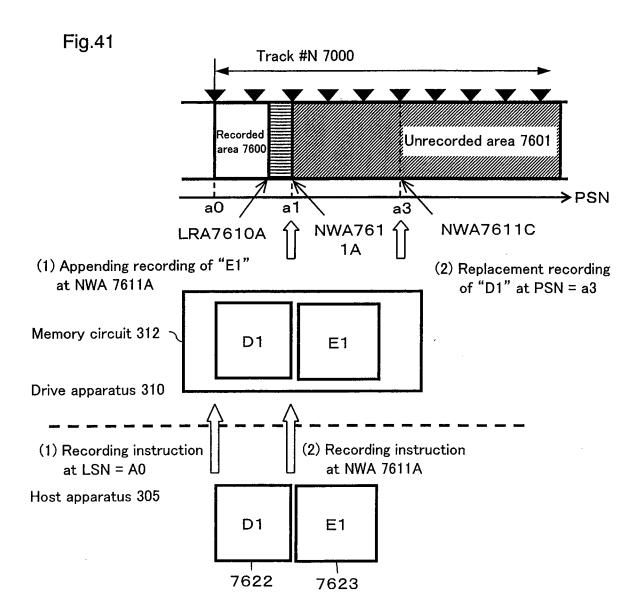
6602

6603









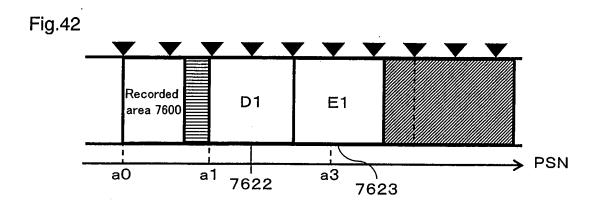
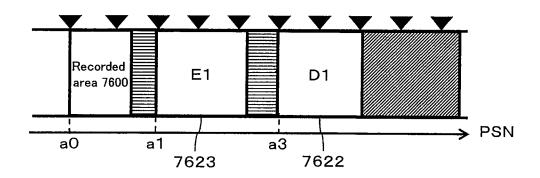
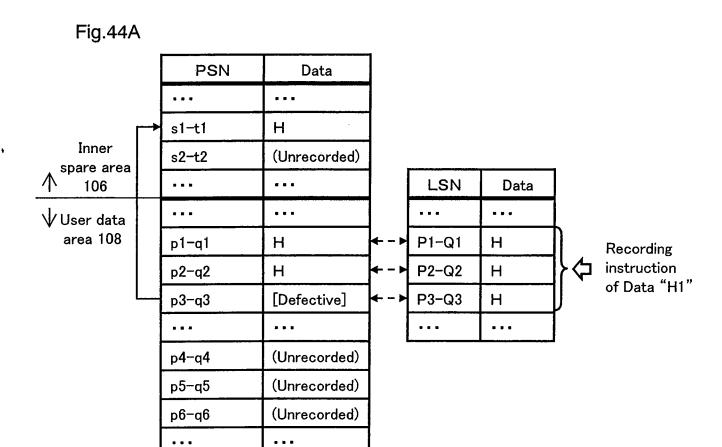


Fig.43





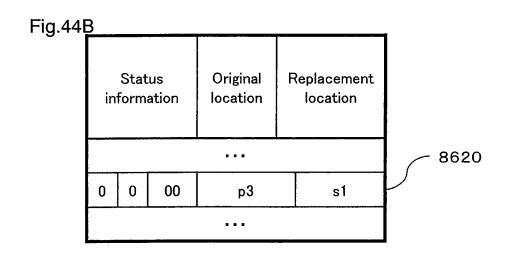


Fig.45A

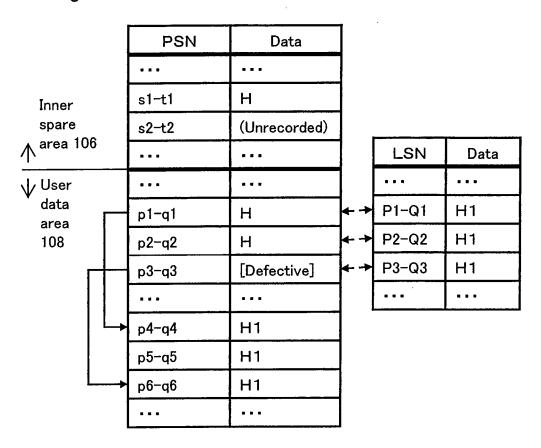


Fig.45B

| in | Stat form | us ation | Original location | Replacement location | |
|----|--------------|-------------|----------------------|-------------------------|-----|
| | | | | | |
| 0 | 1 | 01 | p1 | p4 | 86 |
| 0 | 1 | 10 | р3 | - p6 | 862 |
| | | | | | |

Fig.46A

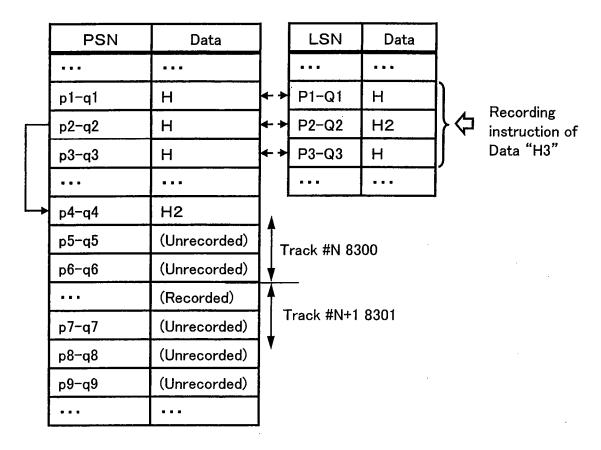


Fig.46B

| Status 1 2011A | Defective cluster first PSN 2012 | Status 2 2011B | Replacement cluster first PSN 2013 | 8302 | |
|-------------------|-------------------------------------|-------------------|--|------|--|
| 0000 | p2 | 0000 | p4 | / | |

Fig.47A

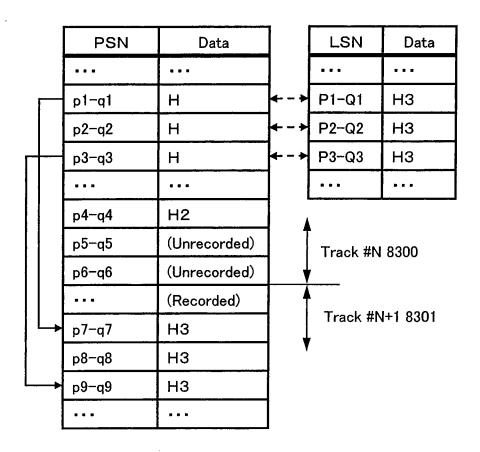


Fig.47B

| Status 1 2011A | Defective cluster first PSN 2012 | Status 2 2011B | Replacement cluster first PSN 2013 | 8400 | |
|-------------------|-------------------------------------|-------------------|--|-------------|--|
| 0000 | p1 | 0001 | р7 | / _ 8401 | |
| 0000 | р3 | 0010 | р9 | Y | |

FIG.48

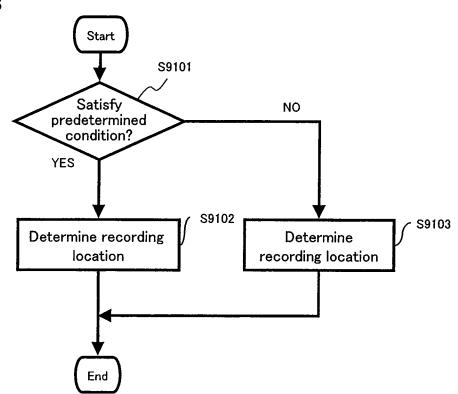


FIG.49A

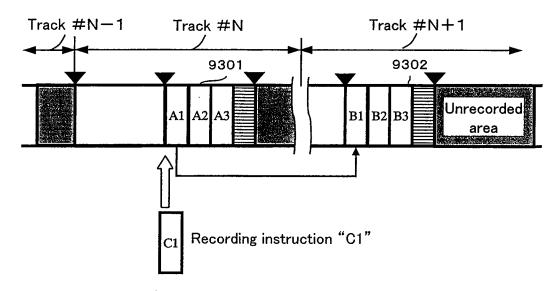


FIG.49B

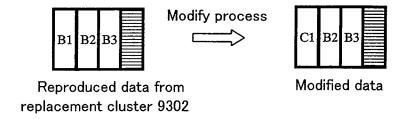


FIG.49C

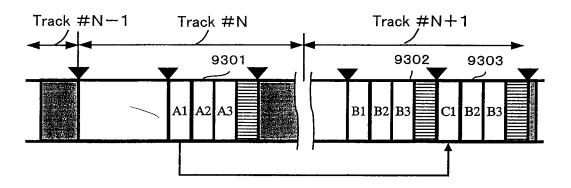


Fig.50

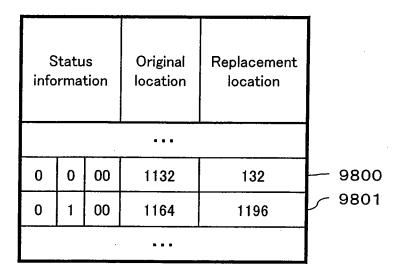


Fig.51

| in | Sta form | tus ation | Original Replacement location location | | | | | | |
|----|-------------|--------------|---|------|--------|------------|--|--|--|
| | | | | | | | | | |
| 0 | 0 | 00 | 0 00 | 1132 | 132 | √ 9800 | | | |
| 0 | 1 | 00 | 1164 | 1196 | 9801 | | | | |
| 0 | 1 | 00 | 1228 | 1260 | y 9810 | | | | |
| | | | | | | | | | |

Fig.52A

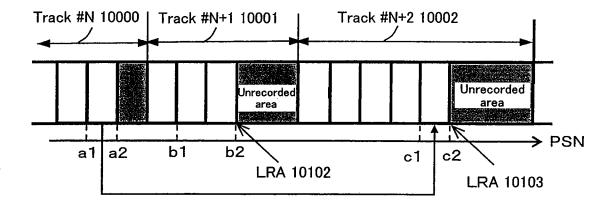


Fig.52B

| Status information 1011 | | | | Original | Replacement |] |
|-------------------------|-------|-------|-------|---------------------------------|---------------------------------|---------|
| Flag1 | Flag2 | Flag3 | Flag4 | location information 1012 | location information 1013 | √ 10800 |
| | | | | a1 | c1 | / 10000 |

Fig.53B

| Sta | tus infor | mation 1 | 011 | Original location information 1012 | Replacement | |
|-------|-----------|----------|-------|---|------------------------------|-------|
| Flag1 | Flag2 | Flag3 | Flag4 | | location information 1013 | 10800 |
| | | | | a1 | c1 | |
| | • | • | | a2 | c2 | 1080 |